

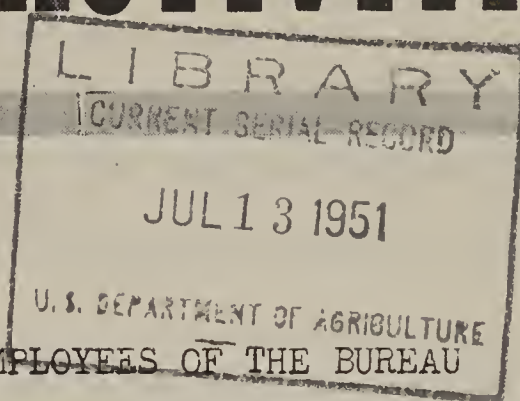
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B P I S A E

RESEARCH ACTIVITIES



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PLANT INDUSTRY STATION, BELTSVILLE, MD.

JUNE 1951

FOR ADMINISTRATIVE USE ONLY

A nationwide survey to find how fertilizer supplies effect the yields of major crops will be completed during the first part of July, says R. Q. Parks (Soils).

The information will give the first comprehensive picture of the fertilizer requirements of various soil types and geographical areas and the response of major crops to different fertilizers and various rates of fertilization.

These data will be of value to State and Federal agencies in planning production guides and the efficient use of fertilizer in short supply.

As chairman of the fertilizer work group established by the National Soil and Fertilizer Research Committee this past spring, Dr. Parks is supervising the assemblage of data and will draft the report of the findings.

A soil scientist in each State has been designated to compile pertinent data on response of major field and horticultural crops to N, P₂O₅, and K₂O. State summaries were scheduled for completion by May 1. These have been used by regional committees to analyze the data and prepare response curves for each crop to each major nutrient.

An increase of 3 percent in the plant nutrient content of commercial fertilizers consumed in the United States and territories during 1949-50 is noted in the annual survey by Walter Scholl and H. M. Wallace (Soils).

Their data show a decrease of about 1 percent in shipments of all commercial fertilizers, mixtures, and separate materials--from 18,541,885 short tons in 1948-49 to 18,354,636 in 1949-50. But the total plant nutrient content (N, available P_2O_5 and K_2O) increased from 3,934,728 tons in 1948-49 to 4,061,529 tons in 1949-50.

In round figures about $5\frac{1}{2}$ million tons of fertilizer went to the South Atlantic States, about $3\frac{1}{2}$ million tons to the East North Central States, a little more than 2.8 million to the East South Central States, nearly 2 million to the Middle Atlantic States, almost 1.3 million to the West South Central States, and a little more than a million tons each to the West North Central and the Pacific regions. The New England States used a half million tons, the Mountain States not quite a quarter million tons. Puerto Rico consumed almost a quarter million tons and shipments to Hawaii totaled a little more than 100 thousand tons.

Commercial mixtures represent 67 percent of the total deliveries of all fertilizers in 1949-50 as compared with 69.2 percent the year before. Grade 3-12-12 replaced the 2-12-6 at the top of the list in tonnage. It amounted to 10.14 percent. The next three high selling grades were 2-12-6, 5-10-5, and 3-9-6 in that order.

Shipments of ammonium nitrate increased from 347,223 tons to 577,562 tons. Distribution of sodium nitrate decreased in all but 10 States. The use of anhydrous ammonia amounted to 85,516 tons as compared with 65,596 tons the year before.

The total distribution of phosphate rock was up slightly, with increases in Missouri, Kansas, and Oklahoma, and a decrease in Illinois. Shipments of concentrated superphosphate are up, those of normal superphosphate down. The total consumption of potash salts was somewhat less than in the preceding year. Muriate of potash was used much more widely than manure salts.

The distribution of minor and secondary element materials showed a decrease reflecting a reduction in use of gypsum from 461,638 in 1948-49 to 394,372 tons in 1949-50.

Expanded research in sansevieria, kenaf, true hemp, and phormium--most promising domestic sources of fiber for cordage and similar uses--was outlined by Elton G. Nelson (C&OFC&D) at a Bureau seminar, May 9.

Edward O. Gangstad, James V. Pate, and J. Frank Joyner are in charge of the work on sansevieria, kenaf, and other subtropical fiber plants at Belle Glade, Fla. You may know sansevieria as an ornamental under its common names--mother-in-law's tongue or snake plant. Bureau workers established its value as a substitute for abaca (manila hemp) in exploratory research during World War II. They demonstrated that it can be produced as a crop in the South and showed that S. trifasciata is the most promising species. It has higher frost resistance and tall growth habits that make it easy to process mechanically. Kenaf holds possibilities as a substitute for jute.

Carl V. Feaster is making the investigations on true hemp established by the Bureau at the Western Kentucky Experiment Station, Princeton. The objective is to find areas of adaptability, good cultural practices, and methods for stockpiling seed. Preliminary findings by E. H. Toole at Plant Industry Station indicate that hemp seeds need cool dry temperatures to maintain viability.

Donald Fishler at Corvallis, Oreg., and J. M. Webber at Berkeley, Calif., are making the investigations on phormium. Previous findings show this plant is adapted to production along the Pacific Coast.

Mr. Nelson also sketched in some of the problems of research in abaca carried on by Bureau workers in Costa Rica (see Research Activities for November 1950).

A note on processing strategic fibers comes from Mills H. Byrom (FP) located at Belle Glade, Fla.

Two bales of sansevieria processed by the Navy into $1\frac{1}{2}$ and 3-inch rope produced yarn about 97 percent as strong as abaca yarn of comparable size and weight. Initial tests show that sansevieria rope has 85 to 90 percent of the tensile strength of abaca.

In visits to large commercial users of long vegetable fibers in the United States, Byrom has found considerable interest in a domestic source. One company that processes about 75 million pounds of fiber annually wants a domestic source and will buy up to 50 percent of its requirements in kenaf. Another company is in the market for 100 tons of sansevieria fiber immediately and would like a continuing domestic supply.

The general view in industry, says Byrom, is that production of sansevieria or kenaf in this country would relieve pressures for other long fibers, often difficult to obtain from foreign markets.

The Rope Walk and Materials Laboratory, now testing sansevieria for the Navy, is preparing a comprehensive report on the fiber and has asked that money be made available for stockpiling it.

Here's a tip for protecting bagged sorghum heads from insects. John B. Sieglinger (CC&D) reports that both corn earworms and aphids can be controlled by treating the bags with a 5 percent emulsion of Aldrin. The treatment was developed by BE&PQ and Oklahoma State Experiment Station workers at the request of Mr. Sieglinger. They've found that the bags may be dipped in the emulsion, dried and stored for several weeks before use, and still give effective insect control.

Southern Cooperative Series Bulletin No. 10. The first publication to come out of S-5, the southern regional soils-weather-nutrition project, is now published under the title, "Studies of Sampling Techniques and Chemical Analyses of Vegetables." S-5 is being conducted cooperatively by eight of the southern stations and the USDA Soil, Plant, Nutrition Laboratory, and the Weather Bureau. The publication should be of value to all concerned with studies of the composition of vegetable crops. The material is based on the cumulative research of the Southern cooperative group, which was initiated in 1937 and intensified in the soils-weather project begun in 1947. The 19 papers in Bulletin 10 are written by various contributors from the Georgia, Louisiana, North Carolina, Oklahoma, Texas, and Virginia Stations.

The Pace report, or officially the Report on Research and Related Activities of USDA, has been published as a Congressional document in 3 volumes--2700 pages. Volume 4, the general index, is being printed and will be available later.

 * NEW VARIETIES *
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BLACKROSE is the third improved variety to come out of the vinifera grape breeding program conducted by Elmer Snyder at the U. S. Horticultural Field Station, Fresno, Calif. Like the previously introduced Cardinal and Calmeria varieties, Blackrose has large berries of attractive color (jet black in this case) and good eating quality. It has shown up well in tests in the San Joaquin, Imperial, and Coachella valleys of California and is recommended for trial as an early-midseason table and shipping grape for this area. A list of 25 growers and nurseries in California, Arizona, and Utah where planting stock may be obtained is available from J.R. Magness (F&NC&D).

 When military officials recently expressed an interest in dehydrated corn, snap beans, green peas, and tomatoes, J. S. Caldwell (ret. '48) and C. W. Culpepper (VC&D) compiled an inventory of suitable varieties and other pertinent information. This was based on studies at Plant Industry Station during World War II when they and their associates tested 62 varieties of yellow corn, 16 of white corn, 32 varieties and 10 unnamed selections of snap beans, 25 varieties of green peas, and 24 varieties of tomatoes. Their results showed that quality in the dehydrated product begins with variety.

Getting research results into print, the Bureau published a total of 44 titles in 10 series during the past 8 months, according to L.E. Childers (Inf.).

Since October 1, 1950, we have brought out 6 new, 3 revised, and 1 reprinted circulars, 6 new and 3 revised farmers' bulletins, 6 new and 3 revised technical bulletins, 2 revised miscellaneous publications, 4 soil survey reports, 6 plant inventories, 2 monographs, 1 bibliographical bulletin, 1 leaflet, and 1 chart.

Largest printing orders--100,000 copies each--were for F 1171 "Growing Annual Flowering Plants," and L 301 "Expensible Farmhouses." Next largest orders were for 25,000 copies each of the chart of potato varieties, F 2021 "Peach Growing East of the Rocky Mountains," and F 1468 (rev.), "Muskmelons."

Biggest publication page-wise was M 200 (rev.) "Manual of the Grasses of the United States." This bound volume--which the Superintendent of Documents sells for \$3.00 a copy--runs to 1,051 pages.

The two monographs--a new feature in USDA's publication series--are Mono. 4 "Balansia and the Balansiae in America," a study by W. W. Diehl (Myc.) and Mono. 7 "Exploratory Study of the Principal Soil Groups of Alaska," by C. E. Kellogg and Ivar Nygard (SS).

The place of punch card equipment in handling research data was described by L.W. Armstrong, assistant chief of the machine tabulating division at Census, in a talk before Bureau workers, May 16. You can get a mimeographed copy of his remarks from David D. Mason, Biometrical Services, Plant Industry Station.

 * NOTES ON PERSONNEL *
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Changes in the Bureau's organization announced April 30 (USDA press release 1081-51) pave the way for more effective supervision, review, and coordination of research already in progress and for better long range planning of the entire program.

The new set-up places added responsibility on 7 key officials--the 3 assistant chiefs: F. P. Cullinan for over-all operations, A. H. Moseman for program planning and coordination, and Edmund Stephens for administrative and business services; and on the directors of research in the four major areas of the Bureau's work: A. W. Turner for agricultural engineering, W. M. Myers for field crops, J. R. Magness for horticultural crops, and F. W. Parker for soils. As the new title "director of research" implies, these men are concerned with both the technical and business aspects of the research under their leadership.

As you will note in the roster on page 9, the research in horticultural crops includes the divisions of forest pathology, mycology and plant disease survey, nematology, and plant exploration and introduction as well as four new divisions made up of large sections in the former division of fruit and vegetable crops and diseases.

The projects on photoperiodism and plant growth regulators will continue under Dr. Magness' supervision in the division of fruit and nut crops and diseases. The potato and onion projects will be in the division of vegetable crops and diseases under V. R. Boswell.

D. F. Beard succeeds Dr. Myers as head of the division of forage crops and diseases. Dr. Beard, who came to the Bureau in June 1950 from Ohio State University, has served as assistant head of the division this past year.

Three superior service awards were presented by Secretary Brannan to workers in this Bureau at the annual USDA honors ceremony, May 16.

Howard W. Whitlock, head cartographic engineer with the Soil Survey, was cited for his work in reorganizing and expanding cartographic operations in the Soil Survey, introducing new methods of map construction and compilation, greatly increasing the quality of maps and quantity of production, reducing costs, and devising methods for advanced planning prior to field mapping.

Mr. Whitlock joined the Bureau in 1947. A native of Ridgeway, S. C., he is a graduate in architectural engineering from Clemson College. He worked with SCS from 1933 until World War II, when he served with the Navy as a lieutenant commander in charge of aerial and ground photography for the North Pacific forces.

Achievements through teamwork were recognized in awards to the U. S. Salinity Laboratory at Riverside, Calif., and to the engineering and mechanical services section of Soils.

The Laboratory received recognition for fundamental research out of which have come vastly improved methods for reclaiming and managing saline soils in the irrigated regions of the West.

We quote from the background information on which the Laboratory was selected for distinction:

"In the only research organization devoted exclusively to saline and alkali soils and irrigation waters as related to agriculture, Laboratory scientists have developed methods for measuring and evaluating the moisture-holding characteristics of soils and for extracting solution from soils over the whole plant growth moisture range. Publications describing these procedures are now used as standard handbooks by public and private agencies in this country and abroad. Special surveys and diagnostic studies for the Bureau of Reclamation, the International Boundary Commission, and other Federal agencies have prevented the irrigation of questionable areas and saved taxpayers and prospective settlers millions of dollars." The Laboratory is directed by H. E. Hayward.

The engineering and mechanical services section was cited for outstanding service to research through the design and development of specialized equipment.

Out of the shops in the basement of the Soils building at Plant Industry Station have come gauge, aggregate, and micro-sieve shakers, stirrers and mechanical pipetting equipment for soil studies----pressure control towers---tensiometers, penetrometers, and soil sampling tools----flumes, impellers, and revolving and tilting bucket-type water meters for irrigation studies---remote handling devices for the preparation of radioactive fertilizers and many other instruments to facilitate soils and plant research. In addition to equipment for this and other Bureaus in ARA, the section has devised instruments for the U. S. Geological Survey and the Department of Defense. J. F. Mullins supervises the unit composed of F. G. Settle, W. D. Donahoo, E. S. Shipley, C. McGogney, C. H. Fischbach, F. M. Jenkins, C. H. Kemere, and J. W. W. Brown.

Length of service awards went to 10 Bureau workers who have had 40 or more years of service in Agriculture as of May 15, 1951. These were Charles W. Bacon, David A. Bisset, J. Allen Clark (ret.), Fred C. Frost, Garner A. Green, Howard A. Houser, Charles M. Matheny, Etta L. Rieser, T. Ray Stanton, and Robert L. Taylor. Mr. Bisset is located at Savannah, Ga. The others have headquarters at Beltsville.

A superior accomplishment award to Irene Brogden, head clerk in the regional Soil Survey office at Knoxville, Tenn., and a cash award to Dewey C. Moore, engineering aid at the U. S. Salinity Laboratory, Riverside, Calif., are announced by Chief Robert M. Salter.

The award to Miss Brogden is in recognition of numerous improvements she has initiated for keeping records clearly, concisely, and adequately. Her revision in the form used to describe a soil series has speeded up the preparation of these forms. She has also greatly improved the filing system and the handling of correspondence, inaugurated a reference card index to scientific articles of interest to the technical staff, and made other helpful suggestions to save time and money in the operation of the office.

A native of Knoxville, Miss Brogden began work in the regional office at Knoxville in 1944 after previous work with TVA and private industry.

Moore earned the cash award by suggesting changes in the heating plant for the head houses, laboratories and 2 greenhouses at the Salinity Lab. Effected at a very small cost these permit the re-circulation of partially heated air and reduce the time required to warm up the buildings from one hour to only 10 or 15 minutes. This has resulted in substantial savings in fuel.

Mr. Moore, who hails from Oklahoma, began work for the Bureau in 1924 as a junior scientific aid assigned to help in date scale eradication work at the Date Garden, Indio, Calif. In 1941 he transferred to the Laboratory at Riverside, where he operates and maintains pressure membrane apparatus and other soil-measuring devices.

J. Richard Adams, soil chemist, has returned to the Bureau to work with K. D. Jacob and associates in Soils on a special research project for the AEC. Mr. Adams, a New Yorker, began his work with USDA in 1923. Most of his research during the next 23 years was concerned with potash resources and the utilization of potash and mixed fertilizers. Since August 1946 he has served as director of technical services for the Spencer Chemical Company in Kansas City.

President Ralph Stewart of Gordon College, Rawalpindi, Pakistan, was a recent visitor to Plant Industry Station. An authority on systematic botany of plants of Pakistan, particularly the Kashmir and Himalayan mountain region, Dr. Gordon has spent the past year at the New York Botanical Garden identifying plants in the Garden's collection. While here he identified plants from the region for PE&I. He is the brother-in-law of George M. Darrow (F&NC&D).

Ross W. Davidson (FP) has transferred from the Beltsville office to the field office at Ft. Collins, Colo., where he will study forest-tree diseases in the Rocky Mountain region.

Milton Fireman (Soils) has recently returned from Greece where he was on an assignment with ECA to work on land reclamation of soils affected by salinity and alkali. In addition to study of so-called black alkali soils, he worked with the soils laboratories on new methods of analyses and interpretation of soils data and acted as consultant with various of the divisions of ECA on fertilizer applications, seed germination, green manuring and drainage design. Dr. Fireman also spent some time in Turkey where he assisted in the establishment of a soils laboratory and in planning for a soil survey program in that country.

Paul D. Olejar, chief technical editor (Inf.) since 1948, transferred May 28 to ARA. In his new post he assists E. G. Moore, coordinator of ARA information, in planning an over-all information program, preparing research reports and speeches, and acting as liaison with the press and radio.

Mr. Olejar's previous government service has been in the Fish and Wildlife Service and in the Bureau of Reclamation, Interior. Prior to entering government, he worked for the Associated Press and later served as director of education for the West Virginia Commissions of Conservation and Roads. During World War II he served in Army ordnance with the rank of major.

 * RETIREMENTS *
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Max A. McCall, assistant chief, is retiring June 30 after 36 years of service. He will continue to serve part time as a consultant for this Bureau and the Department of Defense.

Most of you are familiar with Dr. McCall's record in organizing and advancing plant research. His contributions were summed up in the citation with which he was presented an award at USDA Honors Day last year "for distinguished service to American agriculture through the planning and execution of outstanding research programs, establishing high standards of research and inspiring a high degree of excellence among agricultural scientists."

Dr. McCall was born at Jamestown, Kansas, October 20, 1888. A graduate of Oregon State College in 1910, he had varied experience as a teacher and county agent before becoming dry-land specialist for the Washington Agricultural Experiment Station in 1914. He served as superintendent of the Lind Dry-Land Experiment Station in Washington from 1915 to 1924. During this period he finished work for his MS at Washington State College. He joined the Bureau in 1924 as assistant chief of the Division of Cereal Crops and Diseases. He was made chief of the Division in 1929. Five years later he became assistant chief of the Bureau. He received his doctorate from the University of Wisconsin in 1932.

One of Dr. McCall's major interests has been the improvement of field crop varieties and their wide use on the farm. He was a leader in formulating the concept of cooperative research in which the knowledge and physical resources of Federal-State agencies are pooled to solve mutual problems. He was the author of the Federal Seed Law and a prime mover in the establishment of the foundation seed program to stockpile and channel improved varieties of grasses and legumes from the breeding plots to the farm.

Through publications, speeches, and personal contacts, Dr. McCall has set high standards for agricultural research and promoted a high degree of excellence in the work of research scientists in this country and abroad. In 1948 he was sent on a mission to Italy and in 1949 he was one of three scientists on an agricultural mission to the British territories in Africa.

An honorary member of the International Crop Improvement Association, a former president of the American Society of Agronomy, Dr. McCall holds membership in many professional organizations. He and Mrs. McCall plan to continue making their home at 209 Taylor Street, Chevy Chase, Md.

Charles M. Matheny, administrative officer (C&OFC&D) retired May 31 after 40 years of Federal service. A Nebraskan, Mr. Matheny joined USDA as a clerk March 13, 1911. Except for a short period with BAI in Salt Lake City, he worked continuously with this Bureau. He served as administrative assistant first in crop acclimatization and later in rubber investigations. In 1935 he was appointed to the post he held at retirement. Mr. and Mrs. Matheny make their home at Glenmont, RFD 1, Silver Spring, Md.

Elmer W. Brandes, head of the Division of Sugar Plant Investigations, will retire June 30 after 32 years of Federal Service.

Dr. Brandes was born in Washington, D.C., July 15, 1891. He was educated at Michigan State College, Cornell University, and the University of Michigan.

He came to the Bureau as a pathologist in 1919, directly from service as a second lieutenant in the first World War. Before the war he had spent 2 years as a plant pathologist at the Puerto Rican Agricultural Experiment Station.

Placed in charge of research on sugar plant diseases, he proved that the epidemic disease "yellow stripe," then threatening the industry with extinction, was a virus disease transmitted by the corn louse. To initiate a successful program of breeding new canes for resistance, Dr. Brandes led an expedition to New Guinea and other islands of the South Pacific in search of wild relatives of sugarcane resistant to the disease. He found and brought back several wild canes which were crossed with our domestic varieties to produce the new varieties that have since put the industry back on its feet.

Dr. Brandes also directed breeding work on sugar beets that resulted in new varieties to the curly-top disease, which threatened ruin to western sugar beet growers in the late twenties and early thirties.

Because of his knowledge of tropical agriculture he was placed in charge of the rubber research program established jointly by USDA and Latin American countries in 1940. From the investigations he set up on South American leaf blight have come plant materials and methods for gradually developing a permanent self-sustaining industry.

These and other accomplishments were recognized at the USDA Honors Day ceremony in 1949 when Dr. Brandes was given a distinguished service award "for outstanding performance and leadership to agriculture through the development and administration of research program for sugarcane, sugar beets, and rubber, and for fundamental research on the cause and control of sugarcane mosaic.

Dr. Brandes has received a number of other honors during the past 20 years. In 1929 he was made an honorary member of the Java Experiment Station Association for his fundamental research on mosaic disease "of immeasurable value to all sugarcane countries." He has been an honorary life member of the American Sugarcane League since 1943 and of the American Society of Sugarcane Technologists since 1945. Michigan State College presented him with an alumni award for distinguished service in 1948.

New head of the division of sugar plant investigations will be Cecil H. Wadleigh, plant physiologist of the U.S. Salinity Laboratory, Riverside, Calif. Dr. Wadleigh has made a brilliant record during the past 10 years on the lab staff where he has conducted research on salt tolerance of plants and the water and biochemical relations of plants. A native of Massachusetts, he received his education at Massachusetts State College (BS), Ohio State (MS), and Rutgers (PhD). He came to the Bureau in 1941 after 4 years at the Arkansas Station as assistant agronomist.

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Soil Management and Irrigation	F. W. Parker
Soil Survey	C. E. Kellogg